

A *udit*

R *eport*



ACQUISITION OF THE ADVANCED TANK ARMAMENT SYSTEM

Report No. D-2001-066

February 28, 2001

Office of the Inspector General
Department of Defense

Form SF298 Citation Data

Report Date <i>("DD MON YYYY")</i> 28Feb2001	Report Type N/A	Dates Covered (from... to) <i>("DD MON YYYY")</i>
Title and Subtitle Acquisition of the Advanced Tank Armament System		Contract or Grant Number
		Program Element Number
Authors		Project Number
		Task Number
		Work Unit Number
Performing Organization Name(s) and Address(es) OAIG-AUD (ATTN: AFTS Audit Suggestions) Inspector General, Department of Defense 400 Army Navy Drive (Room 801) Arlington, VA 22202-2884		Performing Organization Number(s) D-2001-066
Sponsoring/Monitoring Agency Name(s) and Address(es)		Monitoring Agency Acronym
		Monitoring Agency Report Number(s)
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes		
Abstract The Army uses the Advanced Tank Armament System (ATAS), an Army Acquisition Category III program, to conduct various technology demonstrations that support other programs. From January 1996 through September 2000, the Army primarily focused the ATAS on the Abrams tank as the platform for its technology demonstrations, such as an advanced fire control system, an automatic target tracker system, a longer cannon barrel, and improved armament. From October 2000 and beyond, the Army planned to terminate earlier ATAS demonstrations, except for the tank and medium caliber armaments demonstrations, and to initiate new technology demonstrations for the Abrams tank and the Bradley Fighting Vehicle Systems. The new technology demonstrations include a fire control system for new ammunition, an accuracy upgrade to the existing fire control system for the Abrams, and a larger cannon for the Bradley. The Army has had the ATAS in the program definition and risk reduction phase of the acquisition process since August 1989. The Army had no plans to transition the ATAS beyond the program definition and risk reduction phase.		
Subject Terms		

Document Classification unclassified	Classification of SF298 unclassified
Classification of Abstract unclassified	Limitation of Abstract unlimited
Number of Pages 39	

Additional Copies

To obtain additional copies of this audit report, visit the Inspector General, DoD, Home Page at www.dodig.osd.mil/audit/reports or contact the Secondary Reports Distribution Unit of the Audit Followup and Technical Support Directorate at (703) 604-8937 (DSN 664-8937) or fax (703) 604-8932.

Suggestions for Future Audits

To suggest ideas for or to request future audits, contact the Audit Followup and Technical Support Directorate at (703) 604-8940 (DSN 664-8940) or fax (703) 604-8932. Ideas and requests can also be mailed to:

OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General, Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-4704

Defense Hotline

To report fraud, waste, or abuse, contact the Defense Hotline by calling (800) 424-9098; by sending an electronic message to Hotline@dodig.osd.mil; or by writing to the Defense Hotline, The Pentagon, Washington, D.C. 20301-1900. The identity of each writer and caller is fully protected.

Acronyms

ACAT	Acquisition Category
ATAS	Advanced Tank Armament System



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-4704

February 28, 2001

MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on the Acquisition of the Advanced Tank Armament System
(Report No. D-2001-066)

We are providing this report for review and to obtain comments and a statement of actions to be taken. This report discusses the viability of the Army's acquisition process to develop and acquire the Advanced Tank Armament System. We considered comments from the Army Program Executive Officer, Ground Combat and Support Systems, on a draft of this report in preparing this final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Army Program Executive Officer, Ground Combat and Support Systems, concurred with Recommendation 1; however, he did not specify what actions he will take to implement the recommendation. Therefore, we request that the Program Executive Officer provide comments by April 30, 2001, addressing when and how he will implement the recommendation.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or Mr. Jack D. Snider at (703) 604-9087 (DSN 664-9087) (jsnider@dodig.osd.mil). See Appendix F for the report distribution. The audit team members are listed inside the back cover.

David K. Steensma
David K. Steensma
Acting Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. D-2001-066

(Project No. D2000AE-0211)

February 28, 2001

Acquisition of the Advanced Tank Armament System

Executive Summary

Introduction. The Army uses the Advanced Tank Armament System (ATAS), an Army Acquisition Category III program, to conduct various technology demonstrations that support other programs. From January 1996 through September 2000, the Army primarily focused the ATAS on the Abrams tank as the platform for its technology demonstrations, such as an advanced fire control system, an automatic target tracker system, a longer cannon barrel, and improved armament. From October 2000 and beyond, the Army planned to terminate earlier ATAS demonstrations, except for the tank and medium caliber armaments demonstrations, and to initiate new technology demonstrations for the Abrams tank and the Bradley Fighting Vehicle Systems. The new technology demonstrations include a fire control system for new ammunition, an accuracy upgrade to the existing fire control system for the Abrams, and a larger cannon for the Bradley. The Army has had the ATAS in the program definition and risk reduction phase of the acquisition process since August 1989. The Army had no plans to transition the ATAS beyond the program definition and risk reduction phase.

Objectives. The primary audit objective was to evaluate the overall management of the ATAS. Because the ATAS was in the program definition and risk reduction phase, we evaluated whether management was cost-effective in readying the system for the engineering and manufacturing development phase of the acquisition process. We also evaluated the management control program as it related to the audit objectives.

Results. The Army did not establish a viable acquisition strategy to develop and acquire the ATAS beyond the program definition and risk reduction phase. Instead, the milestone decision authority considered the ATAS to be a program element for funding technology demonstrations but did not appropriately manage and fund ATAS as a technology demonstration. As a result, the Army obligated about \$85.8 million in research, development, test, and evaluation funds through FY 2000 and planned to obligate another \$62.9 million from FY 2001 through FY 2007 for a program that the Army is not intending to fund for the engineering and manufacturing development phase and the production phase of the acquisition process. On September 30, 2000, the Army reduced the FY 2001 through FY 2007 funding by about \$42 million to about \$20.9 million for the ATAS. Implementing the recommendation would allow the Army to put the \$20.9 million of remaining funds programmed for the ATAS to better use along with the \$42 million previously reprogrammed by the Army. See the Finding section for a discussion of the audit results.

Summary of Recommendations. We recommend that the Program Executive Officer, Ground Combat and Support Systems, discontinue further research, development, test, and evaluation funding for demonstration and validation of the ATAS, and tailor the Army management control program to ensure that systems under his cognizance in the program definition and risk reduction phase of the acquisition process implement an

acquisition strategy that meets the intent of the requirements in DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs."

Management Comments. The Program Executive Officer, Ground Combat and Support Systems, concurred with the recommendations and stated that his office will continue to review all programs under his cognizance to ensure that the systems have an adequate acquisition strategy, are affordable, and are fully funded. The Program Executive Office also provided comments and recommended changes to selected statements in the report. A discussion of the management comments is in the Finding section of the report, and the complete text is in the Management Comments section.

Audit Response. The comments from the Program Executive Officer, Ground Combat and Support Systems, were partially responsive. The Program Executive Officer did not identify what actions his office will take to discontinue further research, development, test, and evaluation funding for demonstration and validation of the ATAS. Accordingly, we request that the Program Executive Officer provide additional comments by April 30, 2001.

Table of Contents

Executive Summary	i
Introduction	
Background	1
Objectives	2
Finding	
Establishing a Viable Acquisition Strategy	3
Appendixes	
A. Audit Process	
Scope and Methodology	11
Management Control Program Review	12
Prior Coverage	13
B. Definitions of Technical Terms	14
C. Acquisition Strategy, Full-Funding, and Management Control	
Evaluation Policy	19
D. Technology Demonstrations in Relation to the Army Science and	
Technology Program Process	21
E. Audit Responses to Army Comments Concerning the Report	24
F. Report Distribution	27
Management Comments	
Department of the Army	29

Background

The Army uses the Advanced Tank Armament System (ATAS), an Army Acquisition Category III program, to conduct various technology demonstrations that support other programs. From February 1990 through December 1995, the ATAS technology demonstrations concentrated on developing a common fire control system for a family of combat vehicles, including a new main battle tank that the Army canceled in December 1995. From January 1996 through September 2000, the Army primarily focused the ATAS on the Abrams tank as the platform for its technology demonstrations, such as an advanced fire control system, an automatic target tracker system, a longer cannon barrel, and improved armament. Beginning in October 2000, the Army planned to terminate earlier ATAS demonstrations, except for the tank and medium caliber armaments demonstrations,¹ and to initiate new technology demonstrations for the Abrams tank and the Bradley Fighting Vehicle Systems. The new technology demonstrations include a fire control system for new ammunition, an accuracy upgrade to the existing fire control system for the Abrams, and a larger cannon for the Bradley. General Dynamics Land Systems, Raytheon Systems, and Rheinmetall are the contractors for the ATAS technology demonstrations. Appendix B provides definitions of technical terms used in this report.

The Project Manager, Tank and Medium Caliber Armament Systems, functions as the lead materiel developer for the ATAS with overall management and integration responsibility and reports to the Program Executive Officer, Ground Combat and Support Systems, who is the milestone decision authority for the ATAS. In FY 2000, the Project Office, Tank and Medium Caliber Armament Systems, transferred the drawings for an electronic muzzle reference system to the Abrams Program Office to cost-effectively eliminate radioactively generated light sources from the Abrams tank muzzle reference system; however, the Army does not have funding for the electronic muzzle reference system. The Project Office also transferred a fire control system simulator to the Future Scout and Cavalry System Advanced Technology Demonstration (the Future Scout). However, the Army has no plans to acquire the Future Scout.

The Army has had the ATAS in the program definition and risk reduction phase² of the acquisition process since August 1989. However, the Army had no plans to transition the ATAS from the program definition and risk reduction phase to the engineering and manufacturing phase or to the production phase. The ATAS receives its funding under the Demonstration and Validation Program Element, "Advanced Tank Armament System."³ In September 2000, the program element included about \$412.9 million in research, development, test, and evaluation funding from FY 2000 through FY 2007 to support the

¹Named the Advanced Tank Armament System before September 1999.

²Previously called the demonstration and validation phase of the acquisition process.

³The demonstration and validation program element funding is only available for program definition and risk reduction efforts.

demonstration and validation of two projects: the Tank and Medium Caliber Armaments that is the ATAS, totaling about \$22.9 million, and the Interim Armored Vehicle family,⁴ totaling about \$390 million.

Objectives

The primary audit objective was to evaluate the overall management of the ATAS. Because the ATAS was in the program definition and risk reduction phase, we evaluated whether management was cost-effective in readying the system for the engineering and manufacturing development phase of the acquisition process. We also evaluated the management control program as it related to the audit objectives. See Appendix A for a discussion of the audit scope and methodology, the review of the management control program, and prior coverage related to the audit objectives.

⁴Because of the urgency of the Army transformation to the Brigade Combat Team concept that will be capable of deployment to anywhere on the globe in a combat ready configuration, the Army placed the funding for the Interim Armored Vehicle family in the ATAS program element until it establishes a separate program element for the acquisition of the Interim Armored Vehicle family.

Establishing a Viable Acquisition Strategy

The Army did not establish a viable acquisition strategy to develop and acquire the ATAS beyond the program definition and risk reduction phase. This condition occurred because the milestone decision authority did not consider the ATAS to be a program and therefore did not require:

- full funding for the engineering manufacturing development and production phases of the acquisition process, and
- the same level of management control as Acquisition Category I and II programs under his cognizance.

Instead, the milestone decision authority considered the ATAS to be a program element for funding technology demonstrations but did not appropriately manage and fund ATAS as a technology demonstration. As a result, the Army obligated about \$85.8 million in research, development, test, and evaluation funds through FY 2000 and planned to obligate another \$62.9 million from FY 2001 through FY 2007 for a program that the Army does not intend to develop and fund beyond the program definition and risk reduction phase of the acquisition process. On September 30, 2000, the Army reduced the FY 2001 through FY 2007 funding by about \$42 million to about \$20.9 million for the ATAS.

Acquisition Strategy, Full-Funding, and Management Control Evaluation Policy

The following provides an overview of acquisition strategy, full-funding, and management control evaluation policy concerning the ATAS. Appendix C provides a detailed discussion of the policy.

Acquisition Strategy Policy. The policy requires the program manager to develop and document an acquisition strategy serving as the roadmap for program execution from program initiation through post-production support and including the critical events that govern the management of the program.

Full-Funding Policy. The policy requires that the program manager document full-funding in the Future Years Defense Program for acquisition programs that are beyond the milestone decision to enter the program definition and risk reduction phase in the acquisition process.

Management Control Evaluations for Less-Than-Major Defense Acquisition Programs. The policy requires that the program executive officer use milestone decision documentation requirements in DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major

Automated Information System (MAIS) Acquisition Programs,” Change 4, May 11, 1999, as the key management controls for the management control evaluation of less-than-major Defense acquisitions.

Fulfilling Acquisition Management Requirements

The Army did not establish a viable acquisition strategy to develop and acquire the ATAS. This occurred because the milestone decision authority did not consider the ATAS to be a program and therefore did not require:

- full funding for the engineering and manufacturing development, and production phases of the acquisition process and
- the same level of management control as Acquisition Category I and II programs.

Acquisition Strategy and Program Reviews. The Program Executive Officer, Ground Combat and Support Systems (the Program Executive Officer), as the milestone decision authority, did not require the Project Office, Tank and Medium Caliber Armament Systems (the Project Office), to have an acquisition strategy and program reviews for the ATAS during the program definition and risk reduction phase of the acquisition process. Instead, the Program Executive Officer relied on quarterly status briefings and budget justification exhibits to oversee the ATAS. As a result, the Project Office did not prepare an acquisition strategy plan for program execution from program initiation through post-production support that included the critical events that govern the management of the ATAS.

On October 7, 1996, the Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army for Research, Development, and Acquisition,⁵ issued a memorandum, stating that the Program Manager, Abrams Tank System, would manage and control future ATAS integration efforts for the Abrams tank beyond the then-current ATAS technology demonstrations. However, that program management transition has not occurred. If the Program Office, Abrams Tank System, assumes responsibility as directed in the memorandum for new ATAS technology demonstrations for the Abrams tank, it will need to prepare the required acquisition strategy documentation, in accordance with DoD Regulation 5000.2-R.

Full-Funding Strategy. The Army funded the ATAS only for the program definition and risk reduction phase of the acquisition process. However, the Program Executive Officer did not consider the ATAS to be an acquisition program but instead a program element for funding technology demonstrations that he believed might eventually transition into a program, even though the ATAS entered the program definition and risk reduction phase of the acquisition process in August 1989. Further, the Program Executive Officer stated that the Office of the Army Deputy Chief of Staff for Operations and Plans and the user

⁵Renamed Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology.

representative, the Army Training and Doctrine Command, establish requirements and funding levels and not the Program Executive Office. As a result, the Program Executive Officer did not require the ATAS to be fully funded for the engineering manufacturing development and production phases of the acquisition process.

Program Element Funding. Even though the Program Executive Officer did not consider the ATAS to be a program, the funding that the Army provided for the ATAS is for an acquisition program in the program definition and risk reduction phase of the acquisition process. The Army Research, Development, Test, and Evaluation Budget Item Justification (R-2 Exhibit), September 2000, Program Element No. 0603653A for the ATAS shows research, development, test, and evaluation funding for the demonstration and validation budget activity (6.4 funding). DoD Regulation 7000.14-R, “Financial Management Regulation, Volume 2A, Budget Presentation and Formulation,” June 2000, states that program elements in the demonstration and validation budget activity involve efforts in the program definition and risk reduction phase of the acquisition process. The R-2 Exhibit indicates that the ATAS technology demonstrations were funded by the Tank and Medium Caliber Armaments project, an Acquisition Category III program, that performs system-level demonstrations of lethality technology for the Bradley Fighting Vehicle, the Abrams tank, the Interim Armored Vehicle, and future forces.

Technology Demonstration Requirements. Because the Program Executive Officer considered the ATAS to be a program element for funding technology demonstrations, the Army should have adhered to requirements in Army Pamphlet 70-3, “Research, Development, and Acquisition--Army Acquisition Procedures,” July 15, 1999, for ensuring that:

- the ATAS technology demonstrations were within the Army investment strategy and plans;
- the Army used the appropriate type of research, development, test, and evaluation funding for the ATAS; and
- the appropriate Army organization designated and managed the ATAS.

According to the pamphlet, a technology demonstration shows whether a science and technology objective⁶ has successfully achieved its objectives, highlights a new technical capability developed in the science and technology community, or assesses the technical maturity of a capability identified outside of the science and technology objective community. In reference to the ATAS, the Army has

⁶A science and technology objective is a significant, reasonably predictable science and technology achievement described by one or more specific, quantified technical objectives to be achieved by a specific fiscal year. The objective is fully funded by 6.2 (applied research) or 6.3 (advanced technology development) types of research, development, test, and evaluation funds. The responsible research and development major command will assign a science and technology objective manager to manage and be accountable for the timely achievement of each science and technology objective. The science and technology objective should be achieved within 3 to 6 years of its initiation and must include measurable and quantifiable results.

not adhered to requirements in the pamphlet for funding technology demonstrations in the areas of investment strategy and plans, appropriate funding, appropriate management, and funding requirements.

Investment Strategy and Plans. The Army had not ensured that the ATAS technology demonstrations conformed to the Army science and technology vision, strategy, principles, and priorities. Army Pamphlet 70-3 states that, after approval by the Army Science and Technology Working Group, the Army lists the science and technology objective in the Army Science and Technology Master Plan. The Secretary of the Army and the Chief of Staff, Army, approve the Plan, which the Deputy Assistant Secretary of the Army for Research and Technology normally updates and publishes annually. When asked whether the ATAS or any of its technology demonstrations were in the Plan, the Project Office stated that the ATAS was not because the ATAS was a system-level demonstration. The Project Office defines a system-level demonstration as a particular kind of prototyping that demonstrates a mature technology or technologies in a particular platform or product. Further, the Project Office stated that the system-level demonstrations occur during the program definition and risk reduction phase of the acquisition process.⁷ Consequently, if ATAS is a systems-level demonstration occurring during the program definition and risk reduction phase of the acquisition process, then it is a program and not a technology demonstration.

Appropriate Funding. The Army had not used the appropriate research, development, test, and evaluation funding for the ATAS technology demonstrations. Army Pamphlet 70-3 states that technology demonstrations are funded with either 6.2 (applied research) or 6.3 (advanced technology development) types of research, development, test, and evaluation funds. Because the Program Executive Office considered the ATAS to be technology demonstrations, the Army should have funded the ATAS with applied research or advanced technology development funds instead of 6.4 (demonstration and validation) type of research, development, test, and evaluation funds.

Appropriate Management. The Army had not appropriately designated the ATAS as a technology demonstration. Army Pamphlet 70-3 states that the technical director of a science and technology activity, such as the Armament, Research, Development and Engineering Center, can designate a new technology capability as a technology demonstration to show that it has potential application to an advanced technology demonstration, advanced concept technology demonstration, or systems acquisition program. Appendix D further discusses technology demonstrations as part of the Army Science and Technology Program.

If the Program Executive Officer insists that the ATAS is a technology demonstration and not an acquisition program as defined in the DoD 5000 series of regulations, he should discontinue the ATAS as an acquisition program and request that the Technical Director, Armament, Research, Development and Engineering Center, designate the ATAS as a technology demonstration that is

⁷Appendix B contains the Program Manager, Tank and Medium Caliber Armament Systems, definition of a system-level demonstration.

properly funded with either applied research or advanced technology development types of research, development, test, and evaluation funds and is subject to oversight by the Army Science and Technology Working Group.

Requirement for Full Funding. Because the Army funded the ATAS with only research, development, test, and evaluation funding for demonstration and validation, the Program Executive Officer should not allow the ATAS to continue in the program definition and risk reduction phase of the acquisition process until the Army fully funds the ATAS for engineering, manufacturing and development and procurement. Even though the Program Executive Officer stated that the Office of the Army Deputy Chief of Staff for Operations and Plans and the user representative established requirements and funding levels for the ATAS, the Program Executive Officer, as the milestone decision authority, is responsible for ensuring that the ATAS has sufficient resources. DoD Regulation 5000.2-R requires that the milestone decision authority not approve an acquisition program proceeding into the program definition and risk reduction phase and beyond unless sufficient resources, including staffing, are programmed in the most recently approved Future Years Defense Program, or will be programmed in the next Program Objectives Memorandum, Budget Estimate Submission, or President's Budget.

Management Control Reviews. The management control program that the Program Executive Office implemented did not ensure that the Project Office, Tank and Medium Caliber Armament Systems, prepared and maintained required ATAS acquisition strategy documentation, in accordance with DoD Regulation 5000.2-R. To evaluate key management controls for less-than-major Defense acquisition programs, the Army uses milestone decision documentation, including an acquisition strategy. Instead of using milestone decision documentation, the Program Executive Office tailored the management control process by conducting quarterly reviews and analyses with each of the program managers under his cognizance. At the quarterly reviews, the attendees⁸ discussed the program's status and plans, along with affordability and integration issues. However, because the Program Executive Officer did not consider the ATAS to be a program, it did not receive the same intensive level of management as Acquisition Category I and II programs receive at the quarterly reviews. Consequently, the Program Executive Officer did not ensure that the ATAS had an acquisition strategy and was fully funded. For example, the August 2000 briefing charts for the ATAS quarterly review did not identify the lack of an ATAS acquisition strategy and full funding as management control weaknesses and recommend corrective action.

⁸The attendees include representatives from the offices of the Program Executive Officer, Ground Combat and Support Systems; the Program Manager, Tank and Medium Caliber Armament Systems; and the Army Training and Doctrine Command. Representatives for the Training and Doctrine Command attended two of the last four quarterly reviews.

Effect of Continuing the Advanced Tank Armament System Program Without Procurement Funds

Without a viable acquisition strategy for the ATAS, the Army obligated about \$85.8 million in research, development, test, and evaluation funds through FY 2000 and planned to obligate another \$62.9 million from FY 2001 through FY 2007 for a program that the Army does not intend to fund for the engineering and manufacturing development phase and the production phase of the acquisition process. However, on September 30, 2000, the Army reduced the FY 2001 through FY 2007 funding for the ATAS by about \$42 million to about \$20.9 million in the September 2000 R-2 Exhibit.

Efforts Planned For Future Technology Demonstrations. Of the \$20.9 million in research, development, test, and evaluation funds for FY 2001 through FY 2007, about \$12.2 million was for FY 2002 through FY 2007. Because of the reduced funding, the Program Office, Tank and Medium Caliber Armament Systems (the Program Office), plans to use modeling and simulation instead of some technology demonstrations and to provide system-level technology demonstrations for the Bradley Fighting Vehicle, the Abrams tank, the Interim Armored Vehicle, and future forces. Those technology demonstrations include gun improvements, extended range munitions fire control, gun barrel straightening, and medium caliber modeling and simulation.

Funds Put to Better Use. By discontinuing further research, development, test, and evaluation funding for demonstration and validation of the ATAS until the system is ready to proceed in the program definition and risk reduction phase of the acquisition, the Army could put the remaining \$20.9 million⁹ of research, development, test, and evaluation funds for program demonstration and validation to better use, along with the \$42 million previously reprogrammed by the Army. Accordingly, the Army would unnecessarily spend \$20.9 million in program funds on an acquisition program that consists of technology demonstration efforts that may or may not become a part of existing programs, new product improvement programs, or a new acquisition program. Under these circumstances, the prudent course of action would dictate that Army management discontinue the ATAS technology demonstration efforts and put unobligated funds to better use.

Management Comments on the Finding and Audit Responses

Summaries of management comments on the finding and our responses are in Appendix E.

⁹The Program Manager, Tank and Medium Caliber Armament Systems, planned a total of \$20.989 million of research, development, test and evaluation funding for ATAS in FYs 2001 through 2007. The planned funding includes \$8.754 million in FY 2001, \$1.996 million in FY 2002, \$1.982 million in FY 2003, \$1.317 million in FY 2004, \$1.981 million in FY 2005, \$1.981 million in FY 2006, and \$2.978 million in FY 2007.

Recommendations, Management Comments, and Audit Responses

We recommend that the Program Executive Officer, Ground Combat and Support Systems:

1. Discontinue further research, development, test, and evaluation funding for demonstration and validation of the Advanced Tank Armament System.

Management Comments. The Program Executive Officer, Ground Combat and Support Systems, concurred with the recommendation. The complete text is in the Management Comments section of this report.

Audit Response. The Program Executive Officer's comments did not specify what actions he will take to discontinue further research, development, test, and evaluation funding for demonstration and validation of ATAS. Therefore, we request that the Program Executive Officer provide additional comments specifying what actions he will take to implement the recommendation.

2. Tailor the Army management control program to ensure that systems under his cognizance in the program definition and risk reduction phase of the acquisition process implement an acquisition strategy that meets the intent of DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs."

Management Comments. The Program Executive Officer, Ground Combat and Support Systems, concurred, stating that his office has and will continue to review all programs under his cognizance to ensure that the systems have an adequate acquisition strategy and are affordable and fully funded. Further, he stated that his office will conduct a review of programs under his cognizance at the beginning of each fiscal year to determine which programs are due for a milestone review. He cited the Electronic Muzzle Reference Sensor as an example of an ATAS effort for which his office ensured that the appropriate organizations prepared and approved all documentation required in DoD Regulation 5000.2-R. He also stated that the Army will prepare and approve, as required, updates to the acquisition strategy throughout the life cycle.

Audit Response. The Program Executive Officer's action to review all programs to ensure that the systems under his cognizance have an adequate acquisition strategy and are affordable and fully funded meets the intent of our recommendation. However, to cite the Electronic Muzzle Reference Sensor as an example of an ATAS effort that complied with DoD Regulation 5000.2-R documentation is misleading. The Sensor was not an acquisition program, but instead a technology demonstration, the drawings for which the Project Office, Tank and Medium Caliber Armament Systems, transferred to the Abrams Program Office. Because the Sensor was a technology demonstration, DoD and

Army guidance did not require the Project Office to prepare any of the DoD Regulation 5000.2-R documentation, such as the acquisition strategy, before transferring the drawings to the Abrams Program Office.

Appendix A. Audit Process

Scope and Methodology

We conducted the audit from June through December 2000 and reviewed documentation dated from September 1990 to October 2000. We interviewed and obtained documentation from the staffs of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology); the Army Deputy Chief of Staff for Operations and Plans; the Army Armor Center; the Program Executive Office, Ground Combat Systems and Support; the Program Office, Tank and Medium Caliber Armament Systems; and the Program Office, Abrams Tank Systems. Because the ATAS was in the program definition and risk reduction phase, the audit concentrated on whether management was cost-effectively readying the system for the engineering and manufacturing development and production phases of the acquisition process. Consequently, we focused our review on the areas of requirements generation, acquisition planning, program assessments and decision reviews, and test and evaluation.

Auditing Standards. We conducted this program audit in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and accordingly included such tests of management controls as we deemed necessary.

Use of Computer-Processed Data. We did not rely on computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within the DoD. Further details are available on request.

DoD-Wide Corporate Level Government Performance and Results Act Coverage. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following corporate level goal and subordinate performance goal.

- **FY 2001 DoD Corporate Level Goal 2:** Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. (01-DoD-2)
- **FY 2001 Subordinate Performance Goal 2.4:** Meet combat forces' needs smarter and faster, with products and services that work better and cost less, by improving the efficiency of DoD's acquisition processes. (01-DoD-2.4)

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the Defense Weapons Systems Acquisition high-risk area.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. In accordance with DoD Regulation 5000.2-R, acquisition managers are to use program cost, schedule, and performance parameters as control objectives to implement the requirements of DoD Directive 5010.38. Accordingly, we limited our review to management controls directly related to requirements generation, acquisition planning, program assessments and decision reviews, and test and evaluation. We reviewed management's self-evaluation applicable to those controls.

Adequacy of Management Controls. We identified a material management control weakness for the ATAS as defined by DoD Instruction 5010.40. The Program Executive Office, Ground Combat and Support Systems, management controls for implementing the Defense acquisition process were not adequate to ensure that the Project Office, Tank and Medium Caliber Armament Systems, prepared and maintained the required ATAS acquisition strategy documentation, in accordance with DoD Regulation 5000.2-R. Recommendation 2., if implemented, will improve management controls over the ATAS and could result in potential monetary benefits of \$20.9 million (see Finding section). We will provide a copy of the report to the senior official responsible for management controls in the Department of the Army.

Adequacy of Management's Self-Evaluation. Instead of using milestone decision documentation, including an acquisition strategy, to evaluate key management controls for less-than-major Defense acquisition programs, the Program Executive Officer, Ground Combat and Support Systems, tailored his management control program reviews by conducting quarterly reviews and analyses with each of the program managers under his cognizance. Because the Program Executive Officer did not consider the ATAS to be a program, he did not require the same intensive level of management control as Acquisition Category I and II programs under his cognizance. For example, the August 2000 briefing charts for the ATAS quarterly review did not identify the lack of an ATAS acquisition strategy and full funding as management control weaknesses and recommend corrective action. Therefore, the Program Executive Officer did not identify or report the material management control weakness identified by the audit.

Prior Coverage

During the last 5 years, the Army Audit Agency issued Report No. AA 96-252, "Advanced Tank Armament Systems Program," August 12, 1996, that addressed program requirements for the ATAS.

Appendix B. Definitions of Technical Terms

Acquisition Category III. Acquisition Category (ACAT) III programs are defined as those acquisition programs that do not meet the research, development, test, and evaluation and procurement dollar thresholds for an ACAT I, major Defense acquisition program; an ACAT IA, major automated information system; or an ACAT II, major system. The milestone decision authority is designated by the Component Acquisition Executive and will be at the lowest appropriate level.

Acquisition Strategy. An acquisition strategy is a business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. It provides a master schedule for research, development, test, production, fielding, modification, postproduction management, and other activities essential for program success. The acquisition strategy is the basis for formulating functional plans and strategies.

Advanced Concept Technology Demonstration. An advanced concept technology demonstration is a DoD-sponsored program to assess the utility of a near-term, easy-to-field technology solution that responds to military needs that the Joint Requirements Oversight Council has validated. The demonstration evaluates the military value of advanced technologies through a large-scale experiment with an operational unit for a two-year period. By the end of the evaluation period, the Army decides whether to proceed with acquisition of the concept based on the results of the assessment. The Commander, Training and Doctrine Command, approves the Army's advanced concept technology demonstrations.

Advanced Technology Demonstration. An advanced technology demonstration is a technology demonstration characterized by being relatively large scale in resources and complexity but typically focused on a individual system or subsystem; having a finite schedule, typically 5 years or less; containing cost, schedule, and objective performance baselines in an advanced technology demonstration management plan that the Deputy Assistant Secretary of the Army for Research and Technology approves. The Army designs each advanced technology demonstration to meet or exceed exit criteria that the user and the advanced technology demonstration manager agree on at program inception. The Training and Doctrine Command and the materiel developer actively participate in the demonstration.

Army Science and Technology Advisory Group. The Army Science and Technology Advisory Group provides four-star-level oversight of the Army Science and Technology Program, which the Assistant Secretary of the Army for Acquisition, Logistics, and Technology and the Vice Chief of Staff, Army, co-chair.

Army Science and Technology Master Plan. The Army Science and Technology Master Plan (the Plan) provides explicit, resource-constrained guidance to the Army's science and technology organizations, consistent with

the National Military Strategy, Defense Planning Guidance, and the Army's force modernization plans to achieve a trained and ready modern Army. The Deputy Assistant Secretary for Research and Technology annually updates and publishes the Plan, which the Secretary of the Army and the Chief of Staff, Army, approve.

Army Science and Technology Program. The Army Science and Technology Program demonstrates new and emerging technologies that it intends to implement into future military systems to support military needs, solve military problems, and provide a sound basis for acquisition decisions. The Army Science and Technology Program consists of basic research (6.1), applied research (6.2), and advanced technology development (6.3) programs.

Army Science and Technology Working Group. The Army Science and Technology Working Group (the Working Group) is co-chaired by the Deputy Assistant Secretary of the Army for Research and Technology and the Army Assistant Deputy Chief of Staff for Force Development. The Working Group provides two-star-level resolution of pressing science and technology issues before meetings of the Army Science and Technology Advisory Group; recommends to the Army Science and Technology Advisory Group revisions to the Army's science and technology vision, strategy, principles, and priorities; and reviews and approves new and continuing advanced technology demonstrations and science and technology objectives.

Budget Estimate Submission. A budget estimate submission is a DoD Component's submission to the Office of the Secretary of Defense that shows its estimated budget requirements for inclusion in the DoD budget.

Budget Justification Exhibit. A budget justification exhibit is a document that DoD prepares and submits to Congress to support program element budget estimates for appropriation categories, such as research, development, test, and evaluation.

Combat Developer. The combat developer is a command or agency that formulates doctrine, concepts, organization, materiel requirements, and objectives. The term can be used generically to represent the user community in the acquisition process.

Defense Planning Guidance. Defense Planning Guidance is a document that the Secretary of Defense issues every odd year to DoD Components to provide strategic framework for developing the Military Departments' Program Objectives Memorandum. The document is the result of planning by the Joint Staff, OSD, and the Military Departments.

Demonstration and Validation Program Element. The demonstration and validation program element includes funding for all program definition and risk reduction efforts necessary to evaluate integrated technologies in an as realistic as possible operating environment to assess the performance or cost reduction potential of advanced technology. The program definition and risk reduction phase is system specific and includes advanced technology demonstrations that

help expedite technology transition from the laboratory to operational use. A logical progression of program development or production phases, or both, must be evident in the Future Years Defense Program.

Engineering and Manufacturing Development. The objective of the engineering and manufacturing development phase in the acquisition process is to translate the most promising design approach into a stable, interoperable, producible, and cost-effective design; validate the manufacturing process; and demonstrate system capabilities through testing. The intended output of the phase is, as a minimum, a preproduction system which closely approximates the final product, the documentation necessary to enter the production phase, and the test results which demonstrate that the production product will meet stated requirements.

Full Funding. Full funding is a DoD policy that applies to research, development, test, and evaluation; procurement; and military construction appropriation accounts, and is defined in the DoD Financial Management Regulation. Full funding incorporates two related, but different policies. The first states that a DoD Component must identify and set aside sufficient funds in its Future Years Defense Program to cover the Component's best estimate of the annual cost for the program in each fiscal year of the Future Years Defense Program. The second states that full funding is the annual appropriation of funds for the total estimated costs to be incurred in the delivery of a given quantity of a usable end item.

Future Years Defense Program. The Future Years Defense Program is the official DoD document that summarizes the forces and resources associated with programs approved by the Secretary of Defense. Its three parts are the organizations affected, appropriations accounts, and the 11 major force programs

Lethality. Lethality is the probability that a weapon will destroy the target or render it neutral.

Materiel Developer. A materiel developer is a command or agency responsible for research and development and production validation of an item.

Milestone Decision Authority. The milestone decision authority is the individual designated in accordance with criteria established by the Under Secretary of Defense for Acquisition, Technology, and Logistics to approve entry of a program into the next phase of the acquisition process.

National Military Strategy. The National Military Strategy is a document that the Joint Staff develops to provide the advice of the Chairman, Joint Chiefs of Staff, in consultation with the other members of the Joint Chiefs of Staff and the Commanders-in-Chief, to the President, the National Security Council, and the Secretary of Defense concerning national military strategy.

Prototype. A prototype is an original or model on which a later system or item is formed or based. Early prototypes may be built during the program definition

and risk reduction phase of the acquisition process and tested before the milestone decision to enter the engineering and manufacturing demonstration phase of the acquisition process.

President's Budget. The President's budget is the Federal Government's budget for a particular fiscal year, transmitted on the first Monday in February to the Congress by the President in accordance with the Budget Enforcement Act of 1992. It includes all agencies and activities of the executive, legislative, and judicial branches.

Program Definition and Risk Reduction. The program definition and risk reduction phase of the acquisition process consists of steps necessary to verify preliminary design and engineering, build prototypes, accomplish necessary planning, and fully analyze trade-off proposals. The objective is to validate the choice of alternatives and to provide the basis for determining whether to proceed into engineering and manufacturing development.

Program Objectives Memorandum. The Program Objectives Memorandum is an annual memorandum submitted to the Secretary of Defense by the DoD Component heads that recommends the total resource requirements and programs within the parameters of the Secretary of Defense's fiscal guidance. It is the principal programming document that details how a DoD Component proposes to respond to assignments in the defense planning guidance and satisfy its assigned functions in the Future Years Defense Program. The Program Objectives Memorandum shows programmed needs for 5 or 6 years hence, and includes staffing, force levels, procurement, facilities, and research and development.

Quarterly Status Briefing. A quarterly status briefing is a review and analysis that ATAS management presents on a quarterly basis to the program executive office concerning the status of program technology demonstrations.

Research, Development, Test, and Evaluation. Research, development, test, and evaluation are activities for the development of a new system that include basic and applied research, advanced technology development, demonstration and validation, engineering development, developmental and operational testing, and the evaluation of test results.

Science and Technology Objective. A science and technology objective is a significant, reasonably predictable science and technology achievement, fully funded by applied research or advanced technology development research, development, test, and evaluation funds, and is described by one or more specific, quantified technical objectives to be achieved by a specific fiscal year. The science and technology objective should be achieved within 3 to 6 years of initiation and must include measurable and quantifiable results.

System-Level Demonstration. The Program Office, Tank and Medium Caliber Armament Systems, defines a system-level demonstration as a particular kind of prototyping that demonstrates a mature technology or technologies in a particular platform or product. The purpose of the demonstration is to assess how the technology performs from an engineering and limited operational viewpoint when the technology is integrated into a platform, such as the Abrams

tank or the Bradley Fighting Vehicle. In any platform, a large number of systems interact with each other from a mechanical, electrical, chemical, or software standpoint. For example, when new technologies are integrated into the platform, the program manager cannot predict how each technology will interact with other platform systems under all conditions. However, by conducting a system-level demonstration, the program manager can identify any potential interaction problems before the Government goes into the final production design. Consequently, the system-level demonstration minimizes the risk of entering engineering manufacturing and development or production.

Technology Demonstration. A technology demonstration demonstrates the feasibility and practicality of a technology for solving specific military deficiencies and occurs during applied research or advanced technology development, or both. A technology demonstration demonstrates that a science and technology objective has successfully achieved its objectives, highlights a new technology capability developed in the science and technology community, or assesses the technical maturity of a capability identified outside the science and technology community.

Appendix C. Acquisition Strategy, Full-Funding, and Management Control Evaluation Policy

The following discusses relevant policy concerning acquisition strategy, full-funding, and management control evaluation for the ATAS.

Acquisition Strategy Policy. DoD Regulation 5000.2-R, “Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs,” Change 4, May 11, 1999;¹⁰ and Army Regulation 70-1, “Research, Development, and Acquisition, Army Acquisition Policy,” January 15, 1998, provide acquisition strategy policy.

DoD Regulation 5000.2-R. DoD Regulation 5000.2-R requires the program manager to develop and document an acquisition strategy serving as the roadmap for program execution from program initiation through post-production support and includes the critical events that govern the management of the program. The primary goal of the acquisition strategy is to minimize the time and cost of satisfying an identified, validated need, consistent with common sense and sound business practices.

Army Regulation 70-1. Army Regulation 70-1 requires the program manager for an acquisition program to develop the acquisition strategy and the milestone decision authority to review and approve the acquisition strategy at milestone decision points.

Full-Funding Policy. DoD Regulation 5000.2-R; DoD Regulation 7000.14-R, “Financial Management Regulation, Volume 2A, Budget Presentation and Formulation,” June 2000; Army Regulation 70-1; and Army Pamphlet 70-3, “Research, Development, and Acquisition--Army Acquisition Procedures,” July 15, 1999, define requirements for full funding of acquisition programs at program initiation.

DoD Regulation 5000.2-R. DoD Regulation 5000.2-R requires that the milestone decision authority assess affordability at each milestone decision point beginning with program initiation.

DoD Regulation 7000.14-R. DoD Regulation 7000.14-R states that a logical progression of program phases and development and production funding must be evident in the Future Years Defense Program for all programs that are beyond the milestone decision to enter the program definition and risk reduction phase in the acquisition process.

¹⁰DoD initially issued DoD Regulation 5000.2-R on March 15, 1996, which included the acquisition strategy guidance and full-funding guidance, discussed later.

Army Regulation. Army Regulation 70-1 requires program managers to follow guidance and procedures contained in DoD Regulation 5000.2-R for all Army acquisition programs.

Army Pamphlet. Army Pamphlet 70-3 supplements DoD Regulation 5000.2-R and requires that full funding, which is the total cost for developing, procuring, and sustaining an acquisition program, be shown in the most recent Future Years Defense Program for all Army acquisition programs. Further, the Pamphlet discusses the science and technology program, including technology demonstrations.

Management Control Evaluations for Less-Than-Major Defense Acquisition Programs. Army Regulation 11-2, “Army Programs, Management Control,” August 1, 1994, and Army Regulation 70-1 provide Army policy concerning management controls for less-than-major Defense acquisition programs.

Army Regulation 11-2. Army Regulation 11-2 requires the program executive office to prepare a written plan for conducting required management control evaluations for acquisition programs under its cognizance, to keep the plan current, and to use the plan to monitor progress to ensure that management control evaluations are conducted as scheduled.

Army Regulation 70-1. Army Regulation 70-1 identifies the key management controls for the management control evaluation of less-than-major Defense acquisitions as the milestone decision documentation requirements specified in DoD Regulation 5000.2-R. Further, the Regulation requires the program executive officer to evaluate those key management controls using the milestone decision review process.

Appendix D. Technology Demonstrations in Relation to the Army Science and Technology Program Process

Army Pamphlet 70-3, "Research, Development, and Acquisition--Army Acquisition Procedures," July 15, 1999, discusses the technology demonstration and its interaction with the Army Science and Technology Program.

Army Science and Technology Program. The Army Science and Technology Program (the Program) consists of projects, including technology demonstrations, in basic research, applied research, and advanced technology development. The Army uses the Program to demonstrate new and emerging technologies that it intends to implement into future military systems to support military needs, solve military problems, and provide a sound basis for acquisition decisions. The Program, as described in the Army Science and Technology Master Plan, identifies the science and technology investments needed to achieve the Army's vision to timely demonstrate affordable technology and weapon system concepts.

Army Science and Technology Master Plan. The Army Science and Technology Master Plan (the Plan) provides explicit, resource-constrained guidance to the Army's science and technology organizations, consistent with the National Military Strategy, Defense Planning Guidance, and the Army's force modernization plans to achieve a trained and ready modern Army. The Deputy Assistant Secretary for Research and Technology annually updates and publishes the Plan, which the Secretary of the Army and the Chief of Staff, Army, approve. The Plan:

- provides top-down guidance to the Army science and technology community;
- enhances the leveraging of other service, industry, and academia investments;
- responds to White House, congressional, DoD, and Department of the Army guidance and interests;
- focuses science and technology investment at critical mass level on relevant technologies;
- significantly improves science and technology stability, quality, relevance, and efficiency;
- achieves more support for the science and technology investment through an improved understanding of the Army's investment strategy and plans; and
- addresses the Army's complete science and technology program from a variety of perspectives, such as budget program categories for

6.1 (basic research), 6.2 (applied research), and 6.3 (advanced technology development); Defense and Army technology areas; science and technology investment in support of the Army Modernization Plan; supporting capabilities; and technology transfer and leveraging.

The Plan contains a finite set of funded, high-priority science and technology objectives, as well as descriptions of Army advanced technology demonstrations.

Science and Technology Objective. A science and technology objective is a significant, reasonably predictable science and technology achievement described by one or more specific, quantified technical objectives to be achieved by a specific fiscal year. The objective is fully funded by applied research (6.2) or advanced technology development (6.3) types of research, development, test, and evaluation funds. The responsible research and development major command will assign a science and technology objective manager to manage and be accountable for the timely achievement of each science and technology objective. The science and technology objective should be achieved within 3 to 6 years of its initiation and must include measurable and quantifiable results.

Science and Technology Review. The Army Training and Doctrine Command conducts an annual review of all Army 6.1 (basic research), 6.2 (applied research), and 6.3 (advanced technology development) science and technology work to give the combat developer an opportunity to review and assess the relevance of the science and technology work efforts. The annual review also provides feedback to the materiel developers on the relative merits of each science and technology effort. The Army Training and Doctrine Command uses the results from the annual review to identify potential science and technology objective candidates and serves as the executive agent on behalf of the Deputy Assistant Secretary of the Army for Research and Technology, who co-chairs the Army Science and Technology Working Group along with the Assistant Deputy Chief of Staff for Operations and Plans, Force Development Directorate.

Based on formal developmental milestones and achievement measures, the Army Science and Technology Working Group approves each science and technology objective, as well as advanced technology demonstrations, based on reviews and recommendations by its Technical Council. After approval, the Army lists the science and technology objective in the Army Science and Technology Master Plan. The Secretary of the Army and Chief of Staff approve the Army Science and Technology Master Plan, which the Deputy Assistant Secretary of the Army for Research and Technology normally updates and publishes annually.

Technology Demonstration. A technology demonstration demonstrates the feasibility and practicality of a technology for solving specific military deficiencies and occurs during 6.2 (applied research) or 6.3 (advanced technology development) or both. A technology demonstration shows whether a science and technology objective has successfully achieved its objectives, highlights a new technical capability developed in the science and technology community, or assesses the technical maturity of a capability identified outside of the science and technology objective community. The technical director of a

science and technology activity, such as the Armament, Research, Development and Engineering Center, can designate a new technology capability as a technology demonstration to show that it has potential application for transition to an advanced technology demonstration, advanced concept technology demonstration, or systems acquisition program. The activity directors have sufficient flexibility, resources, and authority to initiate projects, explore promising avenues of research and development, and exploit identified science and technology opportunities beyond those discussed in the Army Science and Technology Master Plan. However, budget reductions have reduced this flexibility.

Technology Transition. Generally, the transition point from the demonstration of technology in one or more science and technology projects to a formal acquisition program for a new system occurs at the milestone decision to enter the program definition and risk reduction phase of the acquisition process. This transition occurs after the Army has approved a validated need and has proven that technologies critical to performance are measurable and quantifiable. The Army can also introduce the proven technologies into existing acquisition programs at predetermined points in the program definition and risk reduction phase, engineering manufacturing development phase, and acquisition phases as specified in the acquisition strategy of that program.

The procedures for transitioning technologies resulting from a technology demonstration into an acquisition program depends on whether the technology is going into a new or an existing acquisition program. If the transition is into a new acquisition program, the transition will follow DoD Regulation 5000.2-R procedures for a milestone decision to enter the program definition and risk reduction phase of the acquisition process. If the transition is to an existing program, the timing and circumstances for transitioning the technology from the technology demonstration should be negotiated between the science and technology developer and the gaining systems manager or program manager. Before transition into a new or an existing acquisition program, the Army must have thoroughly tested the new technical capability and demonstrated predictable performance of the new technical capability. Further, the new capability system or system upgrade must have a clear and verified military need and must be cost-effective.

Appendix E. Audit Responses to Army Comments Concerning the Report

Our detailed responses to the comments from the Army Program Executive Officer, Ground Combat and Support Systems (the Program Executive Officer), on statements in the finding of the draft report follows. The complete text of those comments is in the Management Comments section of this report.

Management Comments. The Program Executive Officer provided comments that specifically addressed the audit background; ATAS system demonstrations; acquisition guidance; types of research, development, test, and evaluation funds; and program funding. The following discusses those specific comments and the audit response.

Audit Background. The Program Executive Officer clarified when the ATAS program began. The audit report background states that, “Since August 1989, the ATAS has been in the program definition and risk reduction phase of the acquisition process.” He stated that, in FY 1994, the Army initiated ATAS that was proceeded by two system level technology demonstration programs: the Weapons and Munitions Advanced Technology Program from 1989 through 1990 and the Advanced Tank Cannon Program that the Army canceled in FY 1994. Further, he stated that, from FY 1995 through FY 1999, the program element for ATAS consisted of a single project called the ATAS project. He added that, in FY 2000, the Army expanded the ATAS program element to include two projects: the Tank and Medium Caliber Armament project and the Interim Armored Vehicle Family project. He stated that the report pertains to the Tank and Medium Caliber Armament project.

Audit Response. Even though ATAS has had various names and the Army has funded ATAS using different program elements since program inception, ATAS has been an acquisition program in the program definition and risk reduction phase of the acquisition process since August 1989. Further, the report correctly stated that the funding for the ATAS was under the program element for the Tank and Medium Caliber Armament project.

ATAS System Demonstrations. The Program Executive Officer stated that the Army uses ATAS to perform system demonstrations that allow the Army to assess the benefits, cost, and technical issues associated with system demonstrations. Further, he stated that, if a system demonstration achieves success and the Army approves it, the program progresses into the engineering and manufacturing development or the production phases of the acquisition process as part of other weapon-system-platform upgrades or modifications.

Audit Response. We agree that the Army was using ATAS to conduct various technology demonstrations to support other weapon-system-platform programs. However, technology demonstrations should conform to requirements of the Army’s science and technology vision, strategy, principles, and priorities. Further, Army Pamphlet 70-3 requires the Army to fund

technology demonstrations with applied research or advanced technology development funds instead of acquisition-program type of research, development, test and evaluation funds.

Acquisition Guidance. The Program Executive Officer stated that the Army managed ATAS in accordance with DoD Regulation 5000.2-R and that the Program Manager's Office briefed the Program Executive Office about ATAS at quarterly review and analysis meetings. Further, the Program Executive Officer stated that, DoD Regulation 5000.2-R states that, "The PM shall streamline all acquisitions so that the acquisitions contain only those requirements that are essential and cost-effective." The Program Executive Officer stated that ATAS does not require the same documentation as a major Defense acquisition program because it is an Acquisition Category III program.

Audit Response. If the Army managed ATAS in accordance with DoD Regulation 5000.2-R, the Program Executive Officer would have ensured that the Project Manager, Tank and Medium Caliber Armament Systems, developed and documented an acquisition strategy for ATAS to guide the program from program initiation through post-production support with the primary goal of minimizing the time and cost of satisfying an identified, validated need consistent with common sense and sound business practices. Instead, the Program Executive Office allowed ATAS to be in the program definition and risk reduction phase of the acquisition process for more than 11 years without a specific program goal and full funding for the engineering and manufacturing development and the production phases of the acquisition process.

Concerning the Program Executive Officer's quote from DoD Regulation 5000.2-R, he is taking the quote out of context. The paragraph containing the quote discusses streamlining contract, management data, and acquisition process requirements to meet the specific needs of individual programs. Further, the paragraph preceding the quote states that, "The acquisition strategy shall be developed in sufficient detail to establish the managerial approach that shall be used to achieve program goals." By not ensuring that ATAS has a viable acquisition strategy, the Program Executive Officer has allowed the Project Manager, Tank and Medium Caliber Armament Systems, to proceed with a program that does not have a basis for formulating functional plans and strategies for planning, directing, contracting for, and managing ATAS to achieve program goals.

Concerning the Program Executive Officer's comments about the ATAS not being required to have the same documentation as a major Defense acquisition program because it is an Acquisition Category III program, Army Regulation 70-1 requires program managers to follow guidance and procedures contained in DoD Regulation 5000.2-R for all Army acquisition programs and to develop an acquisition strategy. Further, the Army Regulation requires the milestone decision authority to review and approve the acquisition strategy at milestone decision points.

Types of Research, Development, Test, and Evaluation Funds. The Program Executive Officer stated that the report incorrectly states that ATAS performs technology demonstrations and should therefore be funded with 6.2 (applied research) or 6.3 (advanced technology development) funds instead

of its current 6.4 (demonstration and validation) funds. He stated that ATAS performed system demonstrations and integrations, which, according to the DoD 5000 model, must be funded with 6.4 funding.

Audit Response. The Program Executive Officer did not correctly paraphrase the report. The report states that:

Because the Program Executive Office considers the ATAS to be technology demonstrations, the Army should be funding the ATAS with applied research or advanced technology development funds instead of 6.4 (demonstration and validation) type of research, development, test and evaluation funds.

The DoD Regulation 5000.2-R does not specify the type of funding for system demonstrations; however, it does discuss demonstrations as part of the program definition and risk reduction phase of the acquisition process, which is funded with 6.4 funds. If the Program Executive Officer now considers ATAS to be an acquisition program because it performs system demonstrations and integrations, instead of being a program element for funding technology demonstrations, he should require ATAS:

- to have a viable acquisition strategy to execute the program from program initiation through post-production support and
- to be fully funded for the engineering and manufacturing development and the production phases of the acquisition process.

Program Funding. The Program Executive Officer stated that the report incorrectly states that the Army obligated about \$85.8 million in research, development, test, and evaluation funds through FY 2000 for ATAS. Further, the Program Executive Officer stated that, from FY 1995 through FY 2000, the Army obligated \$44.071 million in research, development, test, and evaluation funds for ATAS, which were for system-level demonstrations that the Army approved and funded.

Audit Response. From August 1989, when ATAS began as the Advanced Tank Cannon System, through FY 2000, the Army obligated about \$85.8 million in research, development, test, and evaluation funds for ATAS.

Appendix F. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition, Technology, and Logistics
Under Secretary of Defense (Comptroller)
 Deputy Chief Financial Officer
 Deputy Comptroller (Program/Budget)

Department of the Army

Commander, Army Materiel Command
Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
 Deputy Assistant Secretary of the Army for Research and Technology
 Program Executive Officer, Ground Combat and Support Systems
 Program Manager, Tank and Medium Caliber Armament Systems
 Program Manager, Abrams Tank System
Assistant Secretary of the Army (Financial Management and Comptroller)
Deputy Chief of Staff for Operations and Plans
Auditor General, Department of the Army
Commander, Army Armor Center

Department of the Navy

Naval Inspector General
Auditor General, Department of the Navy

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force

Other Defense Organization

Director, Defense Contract Management Agency

Non-Defense Federal Organization

Office of Management and Budget

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Department of the Army Comments



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
OFFICE OF THE PROGRAM EXECUTIVE OFFICER
GROUND COMBAT AND SUPPORT SYSTEMS
PICATINNY ARSENAL, NJ 07806-5000

SFAE-GCSS

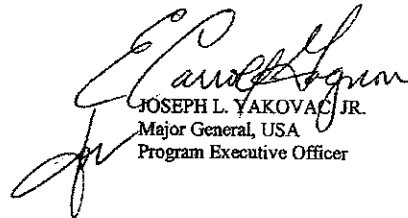
16 FEB 2001

MEMORANDUM FOR INSPECTOR GENERAL DEPARTMENT OF DEFENSE

SUBJECT: Audit Report on the Acquisition of the Advanced Tank Armament System
(Project No. D2000AE-0211)

1. In accordance with AR 36-2, we are forwarding the PEO position to the subject draft report. The reply contains additional facts for the auditors' consideration.
2. The point of contact for this audit is Mr. Peter Vauter, DSN 880-7120.

Encl


JOSEPH L. YAKOVAC JR.
Major General, USA
Program Executive Officer

FINDING: Establishing a Viable Acquisition Strategy

The Army did not establish a viable acquisition strategy to develop and acquire the ATAS beyond the program definition and risk reduction phase. This condition occurred because the milestone decision authority did not consider the ATAS to be a program and therefore did not require:

- full funding for the engineering manufacturing development and production phases of the acquisition process, and
- the same level of management control as for Acquisition Category I and II programs under his cognizance.

Instead, the milestone decision authority considered the ATAS to be a program element for the funding technology demonstrations but did not appropriately manage and fund ATAS as a technology demonstration. As a result, the Army obligated about \$85.8 million in research, development, test and evaluation funds through FY 2000 and planned to obligate another \$62.9 million from FY 2001 through FY 2007 for a program that the Army does not intend to develop and fund beyond the program definition and risk reduction phase of the acquisition process. On September 30, 2000, the Army reduced the FY 2001 through FY 2007 funding by about \$42 million to about \$20.9 million for the ATAS.

Additional Facts: The following comments are offered as clarification to the report:

a. The background of the report (pg 1) states "Since August 1989, the Army has had the ATAS in the program definition and risk reduction phase of the acquisition process." Advanced Tank Armament System (PE 0603653A) was initiated in the President's Budget as a program in FY 1994. The first funding appropriated was in FY 1995. From 1989 through 1994, there were two system level technology demonstration programs that preceded ATAS. The first program was called the Weapons and Munitions Advanced Technology Program. This program existed as PE 6.30.04.A from FY 1989 to FY 1990. The second was called the Advanced Tank Cannon (ATAC) Program. This program existed as PE 6.46.30.A and was cancelled by the Army in FY 1994. These programs were not part of the ATAS and therefore should not be referred to as "ATAS." From FY 1995 through FY 1999 ATAS existed as a single program element (PE 0603653A) with a single project also called the Advanced Tank Armament System (ATAS) project (B99). In FY 2000, the Army changed ATAS (PE 0603653A) to two different projects. The first project is B99, the Tank & Medium Caliber Armaments Project. The second is C03, the Interim Armored Vehicle (IAV) Family. The subject audit report pertains to the Tank &

Medium Caliber Armaments Project. Since the inception of ATAS, Army and Congressional priorities have continually changed. The Army actively responded to these changing priorities by altering the direction and funding of the ATAS four times between FY 1995 and FY 2000.

b. The Army decided through ATAS what technologies show promise and have payoffs for a particular weapon system. ATAS performed system demonstrations that allow the benefits and the costs/technical issues to be properly assessed. If success is achieved and a positive decision from Army Leadership is received, the program progressed into EMD and/or production as part of a platform upgrade or modification.

c. The Army managed the ATAS program in accordance with the guidance set forth in DoD 5000 regulations. The PM Office briefed the PEO Office regularly on the direction and details of ATAS at the quarterly review and analysis meetings. DoD 5000.2 states that, "The PM shall streamline all acquisitions so that the acquisitions contain only those requirements that are essential and cost effective." ATAS is an ACAT III Program and therefore does not require the same documentation as a Major Defense Acquisition Program.

d. The report also states that ATAS performs technology demonstrations and should therefore be funded with 6.2 or 6.3 funding instead of its current 6.4 funding. This is an incorrect statement. ATAS performed system demonstrations and integrations, which according to the DoD 5000 model, must be funded with 6.4 funding.

e. In the report section titled "Establishing a Viable Acquisition Strategy," it is stated that the Army obligated about \$85.8 million in research, development, test and evaluation (RDT&E) funds through FY 2000 for ATAS. This is an inaccurate statement. The RDT&E funds obligated for ATAS from FY 1995 through FY 2000 is \$44.071 million. This funding was for system level demonstrations that were approved and funded by the Army.

Recommendations: We recommend that the Program Executive Officer, Ground Combat and Support Systems:

1. Discontinue further research, development, test and evaluation funding for demonstration and validation of the Advanced Tank Armament System.

Action Taken: Concur

2. Tailor the Army's management control program to ensure that systems under his cognizance in the program definition and risk reduction phase of the acquisition process implement an acquisition strategy that meets the intent of DoD Regulation 5000.2R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs."

Action Taken: Concur. The PEO Office has and will continue to review all programs to ensure that the system has an adequate acquisition strategy and that it is affordable and fully funded. A review of PEO programs will be done at the start of each Fiscal Year to determine which programs are due for a Milestone Review. As demonstrated by the funding and transition of the Electronic Muzzle Reference Sensor from ATAS, the PEO office has been and will continue to ensure that all documentation required in DoD 5000.2R is prepared and approved by the appropriate organization(s). Updates to the acquisition strategy will be prepared and approved, as required, throughout the life cycle.

Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

Thomas F. Gimble

John E. Meling

Jack D. Snider

Neal J. Gause

Frank Downey

Jacqueline N. Pugh

Krista S. Gordon